# Industry Perspective on Proposed Manual Action Rulemaking

April 27, 2005

# Purpose

- Provide NRC Staff with Industry Insights on the Impact of the Proposed Manual Action Rulemaking

- Focus on:
  - SRM Responses
    - Suppression and Detection
    - Time Margins and Time Zero point
  - Response to FRN Questions

# SRM Response

- Will the proposed Rule meet its intended purpose?
  - Clarifies manual actions acceptable for redundant safe shutdown, however clarification to III.G.1 instead of III.G.2 would be more appropriate.
  - Focus on safety
  - Some criteria within the proposed rule will result in high cost with no safety benefit
  - Most sites will submit numerous exemption requests
- Therefore the rule will not meet its intended purpose

# Industry Perspective

- Consider the following aspects:
  - Regulatory
  - Safety
  - Risk
  - Cost

# Regulatory Considerations

- Current Approvals
  - Manual actions have been previously approved and accepted
    - 25 years of precedent for fire protection
    - NUREG 0737, R.G. 1.139, NUREG 1407, ANS/ANSI 58.11, 58.8, IEEE 603, NUREG 0899
  - III.G.1 allows manual actions
    - 1982 Mattson internal memo clarifies this position
    - R.G. 1.189 endorses this position
    - SER's, meeting minutes and approved submittals
- Section III.G in its entirety needs to be considered and applied
- Impact on approved exemption requests and Safety Evaluation Reports needs to be clarified

# Regulatory Considerations

- "Voluntary" nature of the proposed rule needs to be clarified
  - If mandatory, backfit analysis is required

# Safety Considerations

- Defense in Depth provides sufficient margin
  - Administrative controls limit potential for fires to occur
  - Control Room will be aware of fire condition
  - Actions to mitigate fire consequences start before equipment damage occurs
  - Areas with significant hazards are typically provided with suppression systems
  - Historically, less than 4% of fires have resulted in suppression system actuation (EPRI database).

# Safety Consideration

- Operator actions are a necessary element of EOP guidelines
  - Proposed rule could result in conflicts with the EOPs – symptom vs. event based
  - EOP guidelines do not require application of additional time margins
- Acceptance criteria should differentiate between risk and non-risk significant manual actions.
  - Apply simple feasibility criteria to the non-risk significant actions.

# Safety Considerations

- Installation of new suppression systems in safety related and radiation areas could create safety concerns
  - Installation process
  - Pipe breaks
  - Inadvertent actuation
  - Dose (ALARA)
- 50.59 Reviews could result in the need for LAR or exemption request

# Risk Considerations

- Preliminary review identified very small (less than 1E-6/year) risk decrease for adding suppression systems and meeting time margins
- Addition of suppression systems results in a increase in risk
    - Flooding
    - Inadvertent Actuation
    - Installation
- May actually result in a net increase in plant risk

# Risk Considerations

- Suppression systems typically installed in areas with most significant fire hazards
- Detection installed in most plant areas with safety related and safe shutdown components

# Risk Considerations

- Proposed rule drives the addition of Detection and Suppression regardless of risk insights
  - Areas previously screened by fire PRA/IPEEE may require the addition of detection and/or suppression systems

# Cost Considerations

- Suppression and Detection already installed in most areas with significant fire hazards
- Industry sampling found compliance with the proposed rule could result in suppression system installation costs between $10M to $100M per site with no corresponding safety improvement
  - Cost typically underestimated for sprinkler installations
    - Drainage
    - System tie-in and supply pipe sizes
    - Plant obstructions and field conditions

# Cost Considerations

- Exemption Requests
  - Anticipate large number of exemptions per plant
    - Suppression
    - Detection
    - Barriers
  - Even plants that want to comply with the rule will need exemptions requests for specific rooms
    - Turbine Deck
    - Refuel Floor
    - High Radiation Areas
  - Revisions to existing exemption requests (pending clarification)

# Cost Considerations

- Rule will drive expensive changes to Thermo-Hydraulic (T-H) analyses to reallocate margin
- Conservatism is contained within T-H – input deck typically based on LOCA and App. K, adjusted to match App. R scenarios
- T-H analyses are typically controlled by a vendor (proprietary)

# Summary

- Proposed rule will not provide consistency in the regulatory process
- Demonstrated safety or risk improvement is not commensurate with cost for implementation
- Increase in number of exemptions
- Proposed rule will not meet the intended purpose

# Industry Proposal for Rule Language

**See text in bold italics below**

- III.G. Fire protection of safe shutdown capability.
- 1. Fire protection features shall be provided for structures, systems, and components important to safe shutdown. These features shall be capable of limiting fire damage so that:
  - a. One train of systems necessary to achieve and maintain hot shutdown conditions from either the control room or emergency control station(s) is free of fire damage;* and
  - b. Systems necessary to achieve and maintain cold shutdown from either the control room or emergency control station(s) can be repaired within 72 hours.
- ***Free of fire damage is understood as "the structure, system, or component under consideration is capable of performing its intended function during and after the postulated fire, as needed, without repair. The intended function may be performed automatically or by manual operation, from either the main control room, emergency control station(s), or locally." Operator manual actions performed outside the control room must be feasible and reliable.***
- ***Note: Make no changes to Section III.G.2 and do not add Section III.P***

# FRN Question Responses

1) Should the Time Margin consist of a range of multiplicative factors?
2) If a range is appropriate what should the range be and what variables should be considered?
3) Should there be a minimum additive time for short demonstrated times?
4) Are there other means of establishing margin?
5) Should the requirement for a suppression system be automatic or fixed?
6) Should III.G.2 criteria also be applied to III.G.1 and III.G.3 manual actions?